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SMITH, GAMBRELL & RUSSELL			MANCHO, RONNIE M	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/667,396	YONEDA, TAKESHI	
	Examiner	Art Unit	
	RONNIE MANCHO	3664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 19 February 2008.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-3,5-7,9-11,26,29,31,32 and 34-36 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-3,5-7,9-11,26,29,31,32 and 34-36 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 7/25/08.

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) Notice of Informal Patent Application

6) Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 2, 3, 34, 35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 2 recites, "computing the first clutch torque by applying a sliding mode control with a switching function using at least a polarity related to an integral term of the deviation". Applicant does not disclose the meaning of what is meant and encompassed by "a switching function", "polarity related to an integral term of the deviation", and "a sliding mode control".

Although the limitations are recited on page 33 lines 10-17 of applicant's specification, the meets and bounds or the meaning thereof are not provided in such a manner that one skilled in the art can make and use the invention.

As presently set forth, applicant's claimed "first clutch torque computing unit" is essentially a black box with no description of the internals thereof. The disclosure is thus insufficient in failing to set forth in an adequate and sufficient fashion, a description of the internals of the computer readable medium components which would enable the device to perform all of the features (i.e., calculations, etc.) that are disclosed and claimed . If applicant is of the opinion that there is a description in the prior art (in the form of literature, etc. having a

date prior to the filing date of this application), of the internals of the computer readable medium components that can accomplish the disclosed and claimed features (i.e., calculations, etc.), copies of said literature, etc., must be submitted for appropriate review by the Office. See *In re Ghiron et al*, 169 USPQ 723, 727.

Thus the limitations are not enabled.

Claim 3 recites, “said final clutch torque computing unit computes the final clutch torque by a computation comprising said ratio coefficient value, as a first ratio coefficient value, while in association with one of said first and second clutch torques, and together with a second ratio coefficient value while in association with an opposite one of said first and second clutch torques, and wherein the final clutch torque computing unit reduces one of said first and second ratio coefficient values associated with said second clutch torque and increases an opposite one of said first and second ratio coefficient values associated with said first clutch torque as the diameter difference of the tire increases”. The limitations are not clear and confusing. Applicant recites “in association”, what is associated with what? It is further not clear how and in what manner applicant reduces or increases the “one of said first and second ratio coefficient”.

Although the limitations are recited on page 46 to 50 of applicant’s specification, the meets and bounds or the meaning thereof are not provided in such a manner that one skilled in the art can make and use the invention.

As presently set forth, applicant’s claimed “final clutch torque computing unit” is essentially a black box with no description of the internals thereof. The disclosure is thus insufficient in failing to set forth in an adequate and sufficient fashion, a description of the internals of the computer readable medium components which would enable the device to

perform all of the features (i.e., calculations, etc.) that are disclosed and claimed. If applicant is of the opinion that there is a description in the prior art (in the form of literature, etc. having a date prior to the filing date of this application), of the internals of the computer readable medium components that can accomplish the disclosed and claimed features (i.e., calculations, etc.), copies of said literature, etc., must be submitted for appropriate review by the Office. See *In re Ghiron et al*, 169 USPQ 723, 727.

Thus the limitations are thus not enabled.

Claim 34 recites, “said final clutch torque computing unit computes the final clutch torque with a summation involving a first multiplication comprising said first clutch torque and said second ratio coefficient value and a second multiplication comprising said second clutch torque and said first ratio coefficient value”. It is not clear how and in what manner a summation will involve a first multiplication and a second multiplication? The final clutch computing unit is thus a black box with no description of the internals thereof. Thus one skilled in the art will not know how to make and use the invention.

Claim 35 recites, “wherein a contributing value associated with the first clutch torque in the computation of the final clutch torque increases and a contributing value associated with the second clutch torque in the computation of the final clutch torque decreases as the diameter difference of the tire increases, and the contributing value associated with the first clutch torque decreases and the contributing value associated with the second clutch torque increases as the diameter difference of the tire decreases.” Claim 1 already discloses ratio coefficients (Rtr) and (1-Rtr) as disclosed in applicant’s page 49 equation 34. What then is “a contributing value” as

claimed? How then does the contributing value increase or decrease in reference to the diameter difference of the tire?

The limitations are thus not enabled.

Claim Rejections - 35 USC § 103

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 103 that form the basis for the rejections under this section made in this Office action.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. As best understood, claims 1-3, 5-7, 9-11, 26, 29, 31, 32, 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozaki et al (US 2002/0005077) in view of Drexel (6040768).

Regarding claim 1, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) disclose a differential limiting control apparatus for a vehicle having a clutch unit (3, 16, 19) interposed between one rotational shaft 2 and another rotational shaft 9 (fig. 1, sec. 0042-0046) for variably changing a driving force transmission between the one rotational shaft 2 and the other rotational shaft 9, comprising:

a target differential speed setting unit for setting a target differential speed between the one rotational shaft and the other rotational shaft (sec. 0063);

an actual differential speed detecting unit for detecting an actual differential speed between the one rotational shaft and the other rotational shaft (sec. 0063);

a first control unit for computing unit for computing a first clutch torque (FF) of the clutch unit based on a deviation between a target differential speed and an actual differential speed (sections abstract, 0021, 0025, 0031, 0054, 0057, 0063-0080; figs, 1-4, 8-13);

a throttle opening amount detecting unit 40 for detecting a throttle 21 opening (sec. 0041);

a second control unit for computing a second clutch torque (FB) of the first clutch unit based on a throttle opening amount (sections abstract, 0021, 0025, 0031, 0054, 0057, 0063-0080; figs, 1-4, 8-13);

a final clutch torque computing unit (figs 1, 12) for computing a final clutch torque (assist clutch), wherein the final clutch torque computing unit computes the final clutch torque by a computation involving the first clutch torque and the second clutch torque (see assist clutch computed from FF and FB, steps 2072 to 2075; sec. 0074) in association with a ration (i.e. gear ratio of transmission, abstract, sec. 0067) so as to suppress a wheel slippage (sec. 0067)

Ozaki did not disclose “tire diameter”, and “diameter difference of the tire”.

However, Drexel teaches of a differential limiting control apparatus for a vehicle having a clutch unit interposed between one rotational shaft and another rotational shaft for variably changing a driving force transmission between the one rotational shaft and the other rotational shaft, comprising:

computing a ratio coefficient (i.e. a transmission ratio), which ratio coefficient value changes according to a diameter difference of a tire (col. 3, lines 10-25; col. 7, lines 57 to col. 8, lines 14, abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ozaki as taught by Drexel for the purpose of monitoring wear status of a friction clutch (abstract).

Regarding claim 2 (as best understood), Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the differential limiting control apparatus of claim 1, wherein: the first control unit comprises:

a first clutch torque computing unit for computing the deviation between the target differential speed and the actual differential speed and computing the first clutch torque by applying a sliding mode control with a switching function using at least a polarity related to an integral term of the deviation.

Regarding claim 3 (as best understood), Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the differential limiting control apparatus as set forth in claim 1, wherein said final clutch torque computing unit computes the final clutch torque by a computation comprising said ratio coefficient value, as a first ratio coefficient value, while in association with one of said first and second clutch torques, and together with a second ratio coefficient value while in association with an opposite one of said first and second clutch torques, and wherein the final clutch torque computing unit reduces one of said first and second ratio coefficient values associated with said second clutch torque and increases an opposite one

of said first and second ratio coefficient values associated with said first clutch torque as the diameter difference of the tire increases. .

Regarding claim 5, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the differential limiting control apparatus as set forth claim 1, wherein:

the clutch unit is interposed between a front axle and a rear axle.

Regarding claim 6, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the differential limiting control apparatus as set forth claim 2, wherein:

the clutch unit is interposed between a front axle and a rear axle.

Regarding claim 7, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the differential limiting control apparatus as set forth claim 3, wherein:

the clutch unit is interposed between a front axle and a rear axle.

Regarding claim 9, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the differential limiting control apparatus as set forth claim 1, wherein:

the clutch unit limits a differential action of a differential interposed between a left wheel and a right wheel.

Regarding claim 10, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the differential limiting control apparatus as set forth Claim 2, wherein:

the clutch limits a differential action of a differential interposed between a left and a right wheel.

Regarding claim 11, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the differential limiting control apparatus as set forth Claim 3, wherein:

the clutch limits a differential action of a differential interposed between a left and a right wheel.

Regarding claim 12, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the differential limiting control apparatus as set forth Claim 4, wherein:

the clutch limits a differential action of a differential interposed between a left and a right wheel.

Regarding claim 26, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the apparatus as set forth in claim 1, further comprising a brake switch, and when an On signal is inputted from the brake switch, the second clutch torque is made to be zero.

Regarding claim 29, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose a final clutch torque which involves the claimed equation as disclosed by the applicant.

Regarding claim 31, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the ratio coefficient value wherein the ratio coefficient value decreases as diameter difference of tire increase.

Regarding claim 32, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the ratio coefficient value wherein the ratio coefficient value is 0.5 in the case where the diameter difference of the tire is substantially zero.

Regarding claim 34 (as best understood), Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the differential limiting control apparatus as set forth in claim 1, wherein said final clutch torque computing unit computes the final clutch torque with a summation involving a first multiplication comprising said first clutch torque and said second

ratio coefficient value and a second multiplication comprising said second clutch torque and said first ratio coefficient value.

Regarding claim 35 (as best understood), Ozaki (figs. 1, 2; abstract, sec. 0042-0046) as modified by Drexel disclose the differential limiting control apparatus as set forth in claim 1, wherein a contributing value associated with the first clutch torque in the computation of the final clutch torque increases and a contributing value associated with the second clutch torque in the computation of the final clutch torque decreases as the diameter difference of the tire increases, and the contributing value associated with the first clutch torque decreases and the contributing value associated with the second clutch torque increases as the diameter difference of the tire decreases

6. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozaki et al (US 2002/0005077) in view of Drexel (6040768) and further in view of Matsuno (6553303).

Regarding claim 36, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) disclose a differential limiting control apparatus for a vehicle having a clutch unit (3, 16, 19) interposed between one rotational shaft 2 and another rotational shaft 9 (fig. 1, sec. 0042-0046) for variably changing a driving force transmission between the one rotational shaft 2 and the other rotational shaft 9, comprising:

a target differential speed setting unit for setting a target differential speed between the one rotational shaft and the other rotational shaft (sec. 0063);

an actual differential speed detecting unit for detecting an actual differential speed between the one rotational shaft and the other rotational shaft (sec. 0063);

a first control unit for computing unit for computing a first clutch torque (FF) of the clutch unit based on a deviation between a target differential speed and an actual differential speed (sections abstract, 0021, 0025, 0031, 0054, 0057, 0063-0080; figs, 1-4, 8-13);

a throttle opening amount detecting unit 40 for detecting a throttle 21 opening (sec. 0041);

a second control unit for computing a second clutch torque (FB) of the first clutch unit based on a throttle opening amount (sections abstract, 0021, 0025, 0031, 0054, 0057, 0063-0080; figs, 1-4, 8-13);

a final clutch torque computing unit (assist clutch, figs 12) for computing a final clutch torque, wherein the final clutch torque computing unit which computes the final clutch torque by a computation involving the first clutch torque and the second clutch torque (i.e. assist clutch is computed from FF and FB, steps 2072 to 2075; sec. 0074) in association with a ration (i.e. gear ratio of transmission, abstract, sec. 0067) so as to suppress a wheel slippage (sec. 0067)

Ozaki did not disclose, “tire diameter”, and “diameter difference of the tire”.

However, Drexel teaches of a differential limiting control apparatus for a vehicle having a clutch unit interposed between one rotational shaft and another rotational shaft for variably changing a driving force transmission between the one rotational shaft and the other rotational shaft, comprising:

computing a ratio coefficient (i.e. a transmission ratio), which ratio coefficient value changes according to a diameter difference of a tire (col. 3, lines 10-25; col. 7, lines 57 to col. 8, lines 14, abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ozaki as taught by Drexel for the purpose of monitoring wear status of a friction clutch (abstract).

Ozaki and Drexel did not disclose a final clutch section that receives as input a tire diameter difference value. However, Matsuno teaches of a final clutch computing section which receives as input a tire diameter difference value to compute a final clutch.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ozaki and Drexel as taught by Matsuno for the purpose of teaching an easy and cost efficient method to connect a tire difference judging device in a transmission control circuit.

Response to Arguments

7. Applicant's arguments filed 2/19/08 have been fully considered but they are not persuasive.

Applicant argues that the claims have been amended to satisfy the 112 enable requirement. The examiner disagrees and notes that first clutch torque computing unit and final clutch torque computing unit are black boxes as rejected above. In addition, no one knows or ascertains what all is meant and encompassed by "a sliding mode control" and a "switching function". The limitations may be recited verbatim in applicant's specification, but the meanings thereof are not discernable. Applicant copied the limitations from the specification and pasted them into the claims.

Applicant further argues that “Rtr” and “1-Rtr” refer to first and second ratio coefficients respectively. Where is the ratio? “Rtr” etc are not ratios.

Applicant further argues about “a contributing value” corresponding to a percentage term “(1-Rtr).Tlsdfb”. Where is the percentage? What is the distinction between the “ratio coefficient” and the “contributing value”? Applicant appears to be arguing issues not disclosed in the specification.

Applicant further argues that the prior art fails to disclose "differential limiting control apparatus". The examiner disagrees and notes that a transmission and clutch, the CPU, the rear and front differentials and shafts as disclosed by the prior art anticipate the limitation. Applicant makes the argument, but does not explain what a differential limit limiting control is. The MPEP does require the prior art to recite the terminology word for word as disclosed in the claims.

Applicant further argues the prior art fails to disclose all the limitations in the claims. The examiner disagrees and maintains that the prior art, Ozaki (figs. 1, 2; abstract, sec. 0042-0046) disclose a differential limiting control apparatus for a vehicle having a clutch unit (3, 16, 19) interposed between one rotational shaft 2 and another rotational shaft 9 (fig. 1, sec. 0042-0046) for variably changing a driving force transmission between the one rotational shaft 2 and the other rotational shaft 9, comprising:

a target differential speed setting unit for setting a target differential speed between the one rotational shaft and the other rotational shaft (sec. 0063);

an actual differential speed detecting unit for detecting an actual differential speed between the one rotational shaft and the other rotational shaft (sec. 0063);

a first control unit for computing unit for computing a first clutch torque (FF) of the clutch unit based on a deviation between a target differential speed and an actual differential speed (sections abstract, 0021, 0025, 0031, 0054, 0057, 0063-0080; figs, 1-4, 8-13);

a throttle opening amount detecting unit 40 for detecting a throttle 21 opening (sec. 0041);

a second control unit for computing a second clutch torque (FB) of the first clutch unit based on a throttle opening amount (sections abstract, 0021, 0025, 0031, 0054, 0057, 0063-0080; figs, 1-4, 8-13);

a final clutch torque computing unit (figs 1, 12) for computing a final clutch torque (assist clutch), wherein the final clutch torque computing unit computes the final clutch torque by a computation involving the first clutch torque and the second clutch torque (see assist clutch computed from FF and FB, steps 2072 to 2075; sec. 0074) in association with a ration (i.e. gear ratio of transmission, abstract, sec. 0067) so as to suppress a wheel slippage (sec. 0067)

Ozaki did not disclose “tire diameter”, and “diameter difference of the tire”.

However, Drexel teaches of a differential limiting control apparatus for a vehicle having a clutch unit interposed between one rotational shaft and another rotational shaft for variably changing a driving force transmission between the one rotational shaft and the other rotational shaft, comprising:

computing a ratio coefficient (i.e. a transmission ratio), which ratio coefficient value changes according to a diameter difference of a tire (col. 3, lines 10-25; col. 7, lines 57 to col. 8, lines 14, abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ozaki as taught by Drexel for the purpose of monitoring wear status of a friction clutch (abstract).

Regarding the rest of the applicant's arguments to the claims the examiner notes that applicant cannot be arguing limitations that have no disclose meaning or bounds that will enable one skilled in the art to comprehend the invention. The examiner notes that the prior art As Best Understood anticipates the limitations in the claims as pointed out in the rejections above.

The diameter difference refers to the diameter of the tire when there is a change of tire or when the vehicle is going around a corner.

Applicant further argues that the prior art does not disclose the limitations of claim 36 for the same reasons as stated for the other claims. The examiner disagrees and notes that the prior art anticipates the claims as disclosed above.

The arguments to claim 37 are moot in view of its withdrawn status.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RONNIE MANCHO whose telephone number is (571)272-6984. The examiner can normally be reached on Mon-Thurs: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tran Khoi can be reached on 571-272-6919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ronnie Mancho
Examiner
Art Unit 3664

9/22/2008
/KHOI TRAN/
Supervisory Patent Examiner, Art Unit 3664